

SEQUENCE LISTING

<110> Gazit , Ehud
Cherny, Izhack

<120> NOVEL ANTIBACTERIAL AGENTS AND METHODS OF IDENTIFYING AND
UTILIZING SAME

<130> 26920

<160> 131

<170> PatentIn version 3.2

<210> 1
<211> 19
<212> DNA
<213> Artificial sequence

<220>
<223> Single strand DNA oligonucleotide

<400> 1
atgaactgta caaaagagg 19

<210> 2
<211> 23
<212> DNA
<213> Artificial sequence

<220>
<223> Single strand DNA oligonucleotide

<400> 2
gacaagctta gtttcactca atg 23

<210> 3
<211> 19
<212> DNA
<213> Artificial sequence

<220>
<223> Single strand DNA oligonucleotide

<400> 3
gtgaaactaa tctggtctg 19

<210> 4
<211> 26
<212> DNA
<213> Artificial sequence

<220>
<223> Single strand DNA oligonucleotide

<400> 4
tgaagctttt caataatgat aacgac 26

<210> 5
<211> 24
<212> DNA
<213> Artificial sequence

<220>
<223> Single strand DNA oligonucleotide

<400> 5
gtacaatgaa ctgtacaaaa gaag 24

<210> 6
<211> 26
<212> DNA
<213> Artificial sequence

<220>

2

<223> Single strand DNA oligonucleotide

<400> 6
 cctttgaagc ttttcaataa tgataa

26

<210> 7
 <211> 13
 <212> PRT
 <213> Artificial sequence

<220>
 <223> Synthetic peptide

<400> 7

Arg Thr Ile Ser Tyr Ser Glu Ala Arg Gln Asn Leu Ser
 1 5 10

<210> 8
 <211> 13
 <212> PRT
 <213> Artificial sequence

<220>
 <223> Synthetic peptide

<400> 8

Arg Thr Ile Ser Tyr Ser Glu Ala Ala Gln Asn Leu Ser
 1 5 10

<210> 9
 <211> 13
 <212> PRT
 <213> Artificial sequence

<220>
 <223> Synthetic peptide

<400> 9

Arg Thr Ile Ser Tyr Ser Glu Ala Gly Gln Asn Leu Ser
 1 5 10

<210> 10
 <211> 252
 <212> DNA
 <213> Actinobacillus actinomycetemcomitans

<400> 10
 atgaatgtaa taagttattc tgcgtttcgt gcagaattgg caaccacact tgatcaggtg 60
 gtagcagatc atagcccagt catgattacc agacaaaatg gcaaacacgc tgttgtaatg 120
 agtttagaag atttcgcagc ttacgaagaa acggcttatt tattacgcag ccccaaaaat 180
 agagagcgtt tattagcctc tattgaccag ctcaattcag gtaaaatcat cgaacgggaa 240
 ctccaggaat ga 252

<210> 11
 <211> 255
 <212> DNA
 <213> Actinobacillus actinomycetemcomitans

<400> 11
 atgatttttag ctggacgga aaccgcctgg gaagattatc ttatttggca gcaagttgat 60
 aaaaagacgt tgttgccgat taataaactt atccaaaata ttaccagatc acctttcgaa 120
 ggcttaggca atcctaaacc tttaaaacat cagttatccg ggttttgggc tagaagaata 180
 gataaagagc atcgtcttgt ataccaagta tcggatagcc atttaacgat tattcaatgc 240
 cgctatcact actaa 255

<210> 12
 <211> 255
 <212> DNA
 <213> *Agrobacterium tumefaciens*

<400> 12
 atggcgaatg tgcgatttac cgagttcagg cagaacttcg cgacccattt cgaccgggtt 60
 ctggaacccc gcgcgccatt gctcgtcacg cggcaaggca aagaggcggc cgtgggtgctt 120
 gccgaaggag aatatgagag catgcaggaa acgctgcac tcctgtccaa cccggcaaat 180
 gcctcaaggc ttcgcgcgtc catgggcgaa cttgagcgcg gtgacaccat cgagcgggat 240
 ccgaccgaag aatga 255

<210> 13
 <211> 270
 <212> DNA
 <213> *Agrobacterium tumefaciens*

<400> 13
 atgaagctcg tctggacgct gagttcatgg gacgactatg agttctggca aagaaccgat 60
 gctcgcattg tcgagaaaat aaacgatctt atccgaaatg ccaaacgcac gccctttgca 120
 gggcttggga aaccggagcc tctgaagggc gatatggcag gatattggc tcggcggatt 180
 accgccgagc atcggtttgt ctaccgtgta tccgggtccg gaagcgcgca acggctggaa 240
 gtcattcagt gccgcttcca ttaccaataa 270

<210> 14
 <211> 246
 <212> DNA
 <213> *Burkholderia cepacia*

<400> 14
 atgaacgtcc ttacttatag cgaggcgcgt gccggcttca agcaggcgat ggacgacgtc 60
 tgccgcgac acatacccat gctgatcacg aggcagacgg gcgaaaacgt ggtgatggtt 120
 tcgctcgcgg atttcaatgc gatgcaggag acctgtatc tgttgagttc gtcgaagaac 180
 gccacgcggc tcgcccgcac tatecgtcaa ctgaacgccg gcgggtgcgac tgcgcgtgaa 240
 ctgctg 246

<210> 15
 <211> 252
 <212> DNA
 <213> *Burkholderia cepacia*

<400> 15
 atgttcaccg acgacgcgtg ggacgattac ctgtattggc aagagaccga ccggaaggct 60
 gtgcgcaaga tcaacacgct gctggaggag tgccggcgcg atccttatcg cggtagcggg 120
 aaaccggagg cgttgatggg cagcatgagc ggattgtggt ctcggcgat cagctggcc 180
 gaccgtcttg tctacttgcc gcgagacgga aagatctacg tgatgcctt tcgcttcac 240
 tacgactgct ga 252

<210> 16
 <211> 255
 <212> DNA
 <213> *Coxiella burnetii*

<400> 16
 atgaacgtag ttacttttag cgaactcagg gcgcaactta aaaaaatctt ggatctttcc 60
 gccgatcaac acgaacctgt cgtcgtaaa cggccaaata aagaaacat ggtcatttta 120

4

tctttacgcg actttgagggc tctaaaagaa acagcttatc tcttaagtaa cgaagctaata 180
 ggggcccgtc ttcgtcagtc tatccgcagc ttaaaacaag gcaaggcaca aaaaaagaaa 240
 ttaatggaag attaa 255

<210> 17
 <211> 276
 <212> DNA
 <213> *Coxiella burnetii*

<400> 17
 atgcaaatct ccttcacgcc cgaagcctgg gaagattatt tatattggca aaaattcgac 60
 aaaaaaatgc ttcgacgcat taatgaactc attaaggatg ctatgcacga gcctttttcc 120
 ggaaagggaa agccagaacc tttaaaattt gaattacaag gatattggtc aagacgatta 180
 gatcaagaac atcgattggc ctacaaagtt ttagacgatt cgttaatgat tatcgccgca 240
 agatttcact ataatcgctt taattctaaa aactga 276

<210> 18
 <211> 279
 <212> DNA
 <213> *Escherichia coli*

<400> 18
 atgaactgta caaaagagga gattgacatg cgtacaatta gctacagcga agcgcgctcag 60
 aatttgctcg caacaatgat gaaagccgtt gaagatcatg ccccgatcct tattactcgt 120
 cagaatggag aggccttggt tctgatgtca ctcgaagaat acaactcgct ggaagagacg 180
 gcttatctac tgcgctcccc cgctaacgcc cggagattga tggactcaat cgatagcctg 240
 aatcaggca aaggaaacgga aaaggacatc attgagtga 279

<210> 19
 <211> 255
 <212> DNA
 <213> *Escherichia coli*

<400> 19
 gtgaaactaa tctggtctga ggaatcatgg gacgattatc tgtactggca ggaaacagat 60
 aagcgaattg ttaaaaagat caatgaactt atcaaagata cccgcagaac gccatttgaa 120
 ggtaagggga agccagaacc cctgaaacat aatttgctcag gcttctggtc ccgacgcatt 180
 acagaggagc accgtctggt atacgcggtt accgacgatt caotgctcat tgcagcgtgt 240
 cgttatcatt attga 255

<210> 20
 <211> 270
 <212> DNA
 <213> *Enterococcus faecium*

<400> 20
 atggaagcag tagcttattc aaatttcgc caaaatttac gtagttatat gaaacaagtt 60
 aatgaggatg ctgaaacact tattgtaaca agtaaagatg tagaagatac agttgttgta 120
 ttatcaaaaa gagattatga ttctatgcaa gaaacgttga gaacactttc taataattac 180
 gtcattgaaa aaattogtcg aggagatgaa caattctcca aagggtgcatt taaaacacat 240
 gacttaatcg aggttgatc tgatgattaa 270

<210> 21
 <211> 258
 <212> DNA
 <213> *Enterococcus faecium*

5

<400> 21
 atgattaagg cttggtctga tgatgcttgg gatgattatc tttattggca tgagcaagga 60
 aacaaaagca atataaaaaa gattaacaag ttaataaaaag atatcgatcg ttcccccttt 120
 gctggattag gaaaacctga gccattaaag catgatttat ctggaaaatg gtccagaaga 180
 attacagatg aacatagact gatatataga gttgaaaatg aaacgatatt tatttattct 240
 gcaaaagatc actattaa 258

<210> 22
 <211> 258
 <212> DNA
 <213> *Francisella tularensis*

<400> 22
 atgcaaacgg ttaattattc aacttttaga aatgaactat ctgattcaat ggatagagta 60
 acaaaaaatc atagtcctat gattgtaact agaggttcaa aaaaagaagc agttgttatg 120
 atgtcgttag aggattttta agcttatgaa gaaacagcct atcttatgag aagcatgaac 180
 aactataaga gactacaaaa ttctattgat gaagtagaat ctggtttagc tatccaaaaa 240
 gagttgattg aagaatga 258

<210> 23
 <211> 207
 <212> DNA
 <213> *Francisella tularensis*

<400> 23
 atgatacttt cttggtcaac taatgcttgg gaagattatc tatattggca aagcatagat 60
 aagaaaaagc taaaacggat taatttgcta atcaaagaca ttatgagaaa tcactttgat 120
 ggattaggag agcctgaacc tttgaagcat aatttctctg gttattgggc tagacgaata 180
 gacaaagaac atctgaataa tctataa 207

<210> 24
 <211> 222
 <212> DNA
 <213> *Klebsiella pneumoniae*

<400> 24
 atgagaacgg ttaactatag cgaagcccg caaaatctgg ccgatgtgct ggaaagcgca 60
 gtgacagggtg tacctgtgac cattaccgt cgtgggcata aatctgcagt catcattagt 120
 gcagaagagt ttgaacgcta ccaggcgcc agaattggatg atgagttcgc ggctatcatg 180
 gcggttcattg gtgatgagat caggagcctt gcggataaat ga 222

<210> 25
 <211> 369
 <212> DNA
 <213> *Klebsiella pneumoniae*

<400> 25
 atgacgctgc agattatctc agcgggaagag ataatacagt ttcacgacag gctgctccgc 60
 gtcacgcctg gcgttgcccg tatgcccgat ccggggcggtg ccgaagcgat aatgtatagg 120
 gtgctaaaca aaattgaata tgaagggtg acagacgtgt ggcgactcgc tgcgatgcat 180
 ctgctggcga tttctcgcg tcatatattt aatgatggta ataagcgtac ggcaactgttt 240
 atcaccctgc tttttttaa gcgaaatgga attatattgc cagcgaatcc agacttcgtc 300
 ggcatgaccg tcgaggcagc agcagggcaa cttaccctgg aacagattgt cgcgcgtttg 360
 cgtggatga 369

<210> 26
 <211> 276
 <212> DNA
 <213> *Mycobacterium bovis*

<400> 26
 atgagcatca gtgcgagcga ggcgaggcag cgcctgtttc cactcatcga acaggtcaat 60
 accgatcacc agccggtgcg gatcacctcc cgggcccggc atgcggtgct gatgtccgcc 120
 gacgactacg acgcgtggca ggaaacggtc tatctgctgc gctcaccgga gaacgccagg 180
 cggttgatgg aagcggttgc cggggataag gctgggcact cggctttcac caagtctgta 240
 gatgagctgc gggagatggc cggcggcgag gagtga 276

<210> 27
 <211> 258
 <212> DNA
 <213> *Mycobacterium bovis*

<400> 27
 gtgagaagcg tcaacttcga tcccgatgcc tgggaggact tcttgttctg gctggccgct 60
 gatcgcaaaa cggcccgtcg gatcaccggt ttgatcggag aaattcagcg tgatccgttc 120
 agcgggatcg gcaaaccgga gccgctccaa ggtgagttgt cgggatactg gtcgcgccgg 180
 atcgacgacg aacaccggct agtgtatcga gcgggcgacg acgaagtcac gatgctgaag 240
 gcccgatacc actactga 258

<210> 28
 <211> 276
 <212> DNA
 <213> *Mycobacterium tuberculosis*

<400> 28
 atgagcatca gtgcgagcga ggcgaggcag cgcctgtttc cactcatcga acaggtcaat 60
 accgatcacc agccggtgcg gatcacctcc cgggcccggc atgcggtgct gatgtccgcc 120
 gacgactacg acgcgtggca ggaaacggtc tatctgctgc gctcaccgga gaacgccagg 180
 cggttgatgg aagcggttgc cggggataag gctgggcact cggctttcac caagtctgta 240
 gatgagctgc gggagatggc cggcggcgag gagtga 276

<210> 29
 <211> 258
 <212> DNA
 <213> *Mycobacterium tuberculosis*

<400> 29
 gtgagaagcg tcaacttcga tcccgatgcc tgggaggact tcttgttctg gctggccgct 60
 gatcgcaaaa cggcccgtcg gatcaccggt ttgatcggag aaattcagcg tgatccgttc 120
 agcgggatcg gcaaaccgga gccgctccaa ggtgagttgt cgggatactg gtcgcgccgg 180
 atcgacgacg aacaccggct ggtgtatcga gcgggcgacg acgaagtcac gatgctgaag 240
 gcccgatacc actactga 258

<210> 30
 <211> 297
 <212> DNA
 <213> *Neisseria europea A*

<400> 30
 ttggcagaat gtaatgtaca aataaatgta caattggaga accttatgga cgctatcact 60
 tacagcactg ccagagccaa acttgccgac accatgaacc gcgtttcgga taaccatgaa 120
 cctatcataa tcacacgcaa cggagaacaa tccgttgtaa tgatgtcgct cgacgacttc 180

7

aaggcgctgg aggaaacctc ttacctgctc cgtagcccaa agaatgcgaa gcggctgctg 240
gaaagcatcg cagctcttga atcaggcaga ggcgaaacga gaagcctggc agagtga 297

<210> 31
<211> 255
<212> DNA
<213> Neisseria europea A

<400> 31
gtgaagctgg ttttctctga gcaggcctgg gaagactatt tgtactggca aaagacagac 60
cgaaaaacgg tacagcgaat cgatacgctg gtgaaagaga ttacaagaac accacacgag 120
ggtagcggca aacccgagcc actgaaacat gcgctgtcag gttattggtc acgccgtatc 180
aataacgagc accggatcgt ctataaaatt gcggatgact cgttgtttat tgctcaactg 240
agataccact actga 255

<210> 32
<211> 309
<212> DNA
<213> Neisseria europea B

<400> 32
gtgtatcttt tttatacttg tacaatttat tgtgcaaatg aggttgccat gaaggttggt 60
acttattcgc atgcgcgtaa tgcgttaaag tctattttgg atgatgtcat tcaggatgct 120
gatgtaattg ttattagtcg tcgcgatgca gaaggtgatg ctgtggtgat gtcgctggat 180
agctataaca gcatcatgga aacattgcac ttaaccagta atccagcaaa tgccgcagcc 240
ttagccaagg caattgctca ggataaggca ggacaagcac aagaccaccc attgctttct 300
gccgattaa 309

<210> 33
<211> 261
<212> DNA
<213> Neisseria europea B

<400> 33
gtgcgtgccca ttcgttttgt tctgatgctg tgggaggctt acctttactg gcaagaccag 60
gataaaaaaa cgctcaggcg attgaattct ctgattactg ccgcttctcg tgatccattt 120
gttggtattg gcaaacacga accactgcgg ggtgaattgt cgggttattg gtcaagacgt 180
atcgatgaaa ctaatcgttt ggtttatcgt gttactgatg ttgagttagt gattattgct 240
tgccgatttc actatgaata a 261

<210> 34
<211> 243
<212> DNA
<213> Neisseria europea C

<400> 34
atggcaatac taaacgcaac agaagcaaga gcgagggtgt acgccttaat tgatgaggcc 60
gcagaaacac accagcctat tgtgattaag ggaaaaaggt caagtgcggt gcttttatcg 120
gaggaagact ggaacgctat caacgagacg ctttacttgg tttctatccc gggaatgcgc 180
gaatccatta tggagggtat gaaaactgat gtggatgagt gcagtaggga attggattgg 240
taa 243

<210> 35
<211> 261
<212> DNA
<213> Neisseria europea C

<400> 35
 atgtgggagc tgcgatatac ccatcaagcg caaaaggatg caaaaaagct ggcatcgtct 60
 gggcttaaag ataaggcaga ggagttgtta gcggttgtga ggaataatcc gtaccaaacc 120
 ccacccccct atgaaaagct ggttggatgat ttggctggag cctgttcacg ccgtatcaac 180
 atccagcaca ggctcgtgta tcagggtgtg gagcgggaga ggatagtaaa ggttttgcgt 240
 atgtggactc attatgtgta g 261

<210> 36
 <211> 408
 <212> DNA
 <213> Nostoc sp. PCC 7120

<400> 36
 atgtactgga ttaaatttga aagtacacaa agggagcttt taatacttat gctttctaac 60
 acttacactt acacacaagc acgagatcgt ttgtctgaat tatgcgacaa gggtacttca 120
 gaacgtgatt ttgtagtatt tacacgtcgg aatgctgaaa atgctgcttt aatacctgtt 180
 gacgagcttt cgagtctttt agaaactgct catcttttac gttccccacg taacgtgaa 240
 cgtttgctaa gggcttttaga tagagctaaa tcagggtgtg tggaatctca aagtttggat 300
 gatattcgtg aggagttagg atttgaccaa aaagaagagt cacaaaaacc aatcaaacga 360
 agaagttcca gtaactcaa agcaaagaaa aacagtgttt caacctga 408

<210> 37
 <211> 246
 <212> DNA
 <213> Nostoc sp. PCC 7120

<400> 37
 gtgtttcaac ctgaattttt agaagactta gaattttggg tagaaactaa tcaacgagtt 60
 gccttaaagg ctttggatct tgtcaaagag acttgccgag atccttttaa gggaaaaggc 120
 aagcctgaac ctttaaaata tttagatcct gatacttggg ctgcgtcgtt aacgcaagaa 180
 catagaattg tataccttgt taaagacgat gaaataaatt ttttacaagc ccgctatcat 240
 tatata 246

<210> 38
 <211> 255
 <212> DNA
 <213> Pseudomonas fluorescense

<400> 38
 atggacacta tcaactacac cacagctcgt gcgcacttgg ctgaaaccat ggatcgcggtg 60
 aatgaagact gcgccccgct tctggttaacc cgacaaaaag gcgagcctgt agtgatgatg 120
 tctctggccg aatacaacgc gctggaagaa acggcttacc tgctgcgttc tccggccaat 180
 gccgagcgct tgatcaaatc aattggcgaa atgcgcgctg gaaaagccaa agtcaggcaa 240
 ctgattgaag aatga 255

<210> 39
 <211> 255
 <212> DNA
 <213> Pseudomonas fluorescense

<400> 39
 atgaaaatcc agttcacgcc aacgggctgg gaagactact tatggtttca acaaaacgat 60
 aaggccggtc tcaaacgaat caatcttttg atcaaagcga tccagcgcca accctttgaa 120
 ggcttgggca aaccggagcc gctcaagcac aacatgagcg gcttctggtc acggcggata 180
 actgcccagc atcgcttggg ctatgcgcat gtagacggcg aaatctgcgt cataacttgc 240

agatttcact actga 255

<210> 40
 <211> 285
 <212> DNA
 <213> *Pseudomonas putida*

<400> 40
 atgcacgtac tgacttttag ccaggctcgc gccgaactga agcagacaat ggatgatgtt 60
 tgccgggacc atgagcccg cgtaatcacg cgacagcgtg gcgaaccctg agtgatgatg 120
 tctctggagg actacaacgg gatgaacgag accattcacc tgttgggac gtccaaaaac 180
 gcttcgcgct tgcgctcatc catcgctcag ctccgggacg gccaggcctt gacgaaggaa 240
 ctggacctca atgagcaaga accagaagca gcggaacaag aatga 285

<210> 41
 <211> 255
 <212> DNA
 <213> *Pseudomonas putida*

<400> 41
 gtgaagttca ccaaggaggg ctgggaggat tactgtcact ggcagaatgc cgacctcacc 60
 atcctcggca acatcaacgg cctaattgac gtgtgcctac gcacccctt caggggtatt 120
 ggcaagcctg agcgcgtgaa aggcgattta tctggcttgt ggtcccgccg catcacccgt 180
 gagcaccgcc tggctactt cttcgaggcc ggtatgctca cgttcttgea atgcgcctac 240
 cactacgacg actaa 255

<210> 42
 <211> 279
 <212> DNA
 <213> *Pseudomonas syringae*

<400> 42
 atgcaggttt tatcattcag ccaggctcgc gccggtttaa agcaagcgat ggatgatgtg 60
 tgccgggacc atgagccagc actcatcaca cgcctgcgcg gtgatcatgt agtcatgctt 120
 tcccttgatg actacaactc gatgtcagaa accatgtacc tgctaggcac agaggccaat 180
 gcgaagcacc tgcggcaatc cattgcgcag cacaagccg gaaaagcctt cgtaaaggaa 240
 atttcaactgg atgtcacagg gtcagaaca gaagaataa 279

<210> 43
 <211> 249
 <212> DNA
 <213> *Pseudomonas syringae*

<400> 43
 gtgcatttca cctatcggg atgggatgat tacactcact ggaaggatgc cgatcaggca 60
 atttccctgt caatagacag cctcattagc cagtgcctgc gtacgccgtt caaaggcacc 120
 ggtaagccga gacctgac cggcgattta accgggtact ggtcccgccg catcaccaa 180
 gagcatcgtc ttgtctactt ctatgagggc ggtgtactga cagtcacgcg gtgtcgccat 240
 cattactag 249

<210> 44
 <211> 195
 <212> DNA
 <213> *Rickettsia conorii*

<400> 44
 atgaactcaa ttagcggcac ttcatttaga aaaaacttaa gctctgtact aaataccgta 60

10

gaaaacgata atgtccctta tcttattaaa agaaagaatc ataagaatat tattctttta 120
 accgaagaag aatatgaatc tacaaaagaa acattatatt tattatctaa tctggggcta 180
 atgcgaatcg aataa 195

<210> 45
 <211> 234
 <212> DNA
 <213> *Rickettsia conorii*

<400> 45
 acactagaat cagcggagga tttagcgtat tggaaaaaat acgatattaa aaaatatgaa 60
 cgtattaaac ttctaataaa aaatatccaa gaagcaccgg ttacaggat aggtaagccc 120
 gaacctttaa aacatatatt atcagggtta tggtcacgta gaattaacca cgaacataga 180
 ctaatatatt ctgtcaatac taaacaaatt ataatatata attgtagctt tcat 234

<210> 46
 <211> 228
 <212> DNA
 <213> *Salmonella typhi*

<400> 46
 atgtttatgc gtacgggtta ctatagcgaa gcgcggcaaa atctggccga agtcctggaa 60
 agtgcggtga cggggggggc tgttaccatc acgcgtcgtg ggcataagtc cgcagtgatc 120
 atcagcgccg aggagtttga gcgttatcag acggcgcgaa tggatgatga gtttgctgcc 180
 attatggcgg ttcattggca tgagctcagg gagctggcgg ataatga 228

<210> 47
 <211> 369
 <212> DNA
 <213> *Salmonella typhi*

<400> 47
 atgaccctac aacttatctc agcggagag ataattcagt ttcacgacag gcttctccgc 60
 gttacgctg gtgtaacagg catgcctgat cctggccgcg cggaagcgct aatgtaccgg 120
 gtactcaagc aaatcgaata tgaaggggtg accgacgtgt ggctgctggc ggcaatgcat 180
 ttgctcgcta tatcccgtgg gcatatcttc aatgatggta acaaacgtac cgccttattt 240
 attacgtgc tggtttttaa gcgtaacggg atctcactcg ctgcgaatcc ggattttgtc 300
 gatatgacag tcgatgcggc ggcagggcgg cttacgtcgg agcaaattgc cgttgcctga 360
 cgtgcctga 369

<210> 48
 <211> 252
 <212> DNA
 <213> *Streptococcus aureus*

<400> 48
 atgattatta aaaattatc atacgctcga cagaatttaa aggcacttat gacaaaagta 60
 aatgatgata gtgatatggt aactgtaaca tctactgatg ataaaaacgt agtaatcatg 120
 tcagaatcag attataactc catgatggaa acactttacc tccaacagaa cccaaataat 180
 gctgaacact tagctcaatc aattgcagat ctagaacgtg ggaaaactat aacgaaagat 240
 atagatgtat aa 252

<210> 49
 <211> 267
 <212> DNA
 <213> *Streptococcus aureus*

<400> 49
 atgggctaggt taaatattac gttttcgcct caagcctttg aagattataa gtattttcag 60
 cagaacaata aaaaaatggt gaagaagatt aatgagttac ttaaaagtat tgacagaaat 120
 ggtgcattgg aaggatatagg taagcctgaa aagttaaaat cgaatctgac tgggtattat 180
 agtagacgta tcaatcacga acatagattg gtttatacag tagatgacaa tcatataaaa 240
 atagcatcat gtaaatacca ttattaa 267

<210> 50
 <211> 255
 <212> DNA
 <213> *Streptococcus pneumoniae*

<400> 50
 atggaagcag tcctttactc aacattccga aatcatttaa aggactacat gaagaaggta 60
 aatgatgaat ttgagccttt gacgggtggtc aataaaaatc cagatgagga cattgtagtc 120
 ctttcaaaga gtgagtggga tagtatccaa gaaaccctga gaattgctca aaataaggaa 180
 ctttctgata aggttttgcg aggaatggct caagttcgtg ctggaagtac tcagggtccat 240
 gttattgagg agtaa 255

<210> 51
 <211> 255
 <212> DNA
 <213> *Streptococcus pneumoniae*

<400> 51
 atgctgtcga agtttacaga agatgcctgg gcagattatt gctactggca aaatcaggat 60
 aagaaaacgt taaaaagaat caataaacta atcaaggata ttcaactgta tccctttaca 120
 ggaataggta aaccagaacc actcaaatat gattaccaag gagcctgggtc acggcgattat 180
 gatgcagaaa atcgcttgat ttatatgatg gatggagata gcgtggcctt cttgtccttt 240
 aaagatcatt actaa 255

<210> 52
 <211> 264
 <212> DNA
 <213> *Streptomyces coelicolor*

<400> 52
 atgtccatca ccgccagcga agcccgtcag aacctgttcc cgctgataga gcagggtcaac 60
 gaggaccacg ccccggtgca catcacctcc cgcaagggga acgccgtgct catgtccgag 120
 gaggacttca cggcgtggac ggagacggtg catctcctgc gctcgccgag gaacgcccgc 180
 cgtctgctcg actccatcgc ggaggccgag gcgggagcgc cgactgagca cgacctgac 240
 gaccgggacg cggagcgggc gtga 264

<210> 53
 <211> 255
 <212> DNA
 <213> *Streptomyces coelicolor*

<400> 53
 gtgaggatca ctttcacgtc ccacgggtgg gaggactacg tcactgggc cgagagcgac 60
 cggaagggtga ccaagcggat caacagactg atcgccgaca tcgccgtga cccgttcaag 120
 ggcgtcgga agccggagcc gctcaagggc gacctgtccg gctactggtc acggcgcatc 180
 gacgacacgc accgtcttgt gtacaagccc accgatgacc agctggatcat cgtccaggcg 240
 cgctaccact actga 255

<210> 54
 <211> 282
 <212> DNA
 <213> *Streptomyces viridochromogenes*

<400> 54
 atgtcgataa accgcgagcg aagccgcaag gctctctttc cgctgatcaa gaagggtcaac 60
 gacaatcacg aggcacatcga gatcgtctcc aagcacggca acgccgtact cgtctcggcc 120
 gaggattatg cagcgctgcg cgagggtcgc tacctgctgc gctctccggc gaacgcccggt 180
 cgactgctca aggcgtacga gaacgccctt gccacgtca atgtgtcggg gcgggagctg 240
 atcgatccgg attcggcgga cgtgggttcg ggtgccgcgt ga 282

<210> 55
 <211> 255
 <212> DNA
 <213> *Streptomyces viridochromogenes*

<400> 55
 gtgaggcttg tcttcgagga tcagggtcgg gatgactaca cgtcctggct caagaacgac 60
 cgcaagatgc tcgcccgcac caacaagctc atcgaggacg tcaggcgcca ccccttcacg 120
 gggatcggca aaccgcagcc gctgaagtac cacttgccgg gggcggtggc gcggcggatc 180
 gacgacgaac accgcctcgt gtacctggtt acggacaagg agatcgtgat cctcgtgcc 240
 cggtagcact actga 255

<210> 56
 <211> 303
 <212> DNA
 <213> *Synechocystis* sp. PCC 7942

<400> 56
 ttggctaagt gctattgttg tacaacaagc tgtacaactc ctcggctcat gaaagttgtt 60
 tccttcagtg acgccagaaa aaatctcaag actgtcttgg atgaagtcgt caacgacgct 120
 gactacacga tcattactcg ccgcaatgcc gaggaagtcg tggatcatgc cctcgaactc 180
 ttcaatagcc tgatcgaaac cttccacctg ctcaaatccc ctgccaatgc tgctcaccta 240
 caacgctcga tcgctcagta ccagcaaggt caaacagtcg agcgaaatct attagatgcg 300
 taa 303

<210> 57
 <211> 264
 <212> DNA
 <213> *Synechocystis* sp. PCC 7942

<400> 57
 atgcgtaagc tggcttgac aaacgaggct tgggaagatt acctgtattg gcaagggcag 60
 gacaagaaga ccttaaatcg catcaacaag ctcattaccg aaaccttgcg atcgcccttt 120
 gaggggattg gtaagccaga agcgctcagg gagaacctga ctgggttttg gtcacgccgc 180
 attgacgaca ccaatcgctt agtttacgca gtagcagatg actacctgac cattatttcc 240
 tgctcgctacc actacagcga ttaa 264

<210> 58
 <211> 264
 <212> DNA
 <213> *Synechocystis* sp. PCC 6803 A

<400> 58
 atgaaagcaa ttacaaccac ccaagccaaa gatcatttgg atgaattaat taatgctgtc 60
 atttctgatc tagaaccaac catcgcttagc aacaatcaag gtcagcaggc ggtattaata 120

13

tcattggatg aatttaattc ttggcaagaa accctttact tactctctaa tccaaccaac 180
gcagaacatt taatggcatc gattaagcaa gctgaaactg gacagatcat taagcaaaaa 240
ttaccagatt tattggaact gtga 264

<210> 59
<211> 261
<212> DNA
<213> *Synechocystis* sp. PCC 6803 A

<400> 59
gtgaaaatcg cctttaccga gctatcttgg catgattacc tctggtttca gcaaaatgat 60
aaaaaacttc tcaaaagaat taatttactc attaaggcaa ttgccaggga tccttttggat 120
ggatagggaa aaccagaacc actcaaagca aatctttccg gttactggtc gaggcgcac 180
aattctgagc atcgtttggg gtacacgatt gctgatcgag atttactaat tatttcctgc 240
cgattccatt atcaaaggta a 261

<210> 60
<211> 264
<212> DNA
<213> *Synechocystis* sp. PCC 6803 B

<400> 60
atggaaacca ttaattatca acaattctct gaaaaactgc ccactttggg agaaaaaata 60
ggtaatgagc aagaacctct ctgtctagag cttccgaatt atttacgagc tgttattata 120
tctgagcaag attaccgtag tttgatggaa actgtttctc tgttgagtaa ccctgttaat 180
gctgaaaagt tattaactac cgctagtcga tcaattgatc aagctacac gtggacaaaa 240
gtaaaaaatg acttaggact atga 264

<210> 61
<211> 261
<212> DNA
<213> *Synechocystis* sp. PCC 6803 B

<400> 61
atgaaggaag ttgtttttaga ttcgcaggca attgaagata taaagtgggt gattcaacaa 60
gataaaaagt tagcgtaaa aatcatggaa ttaattgaga cgctaccaa atcacctttt 120
gccggcaag gaaaaccaga aaaacttcgt tttaatttgt cagggttttg gccacggcgc 180
attactcaag agcatcgctt agtttacgaa gtcaccgatg atttcattcg tgttgtcagt 240
tgtcgttatc attaccgata g 261

<210> 62
<211> 243
<212> DNA
<213> *Tiobacillus ferrooxidans*

<400> 62
atgtccaccc tcaactgcaag cgaagcacgc gccaacctat atcggtcat tgaccaagcc 60
gctgagtcac atcagcccat ttatctgcgc ggaaagcgga caagtgcggg ccttctctcc 120
acggaagatt gggaagcaat ccaagaaaca ctatacctcc tttccgttcc gggcatgcgc 180
gaatctatca aggagggtat ggctgagccc cttagcaaga gcaatatgga cctcaagtgg 240
tga 243

<210> 63
<211> 252
<212> DNA
<213> *Tiobacillus ferrooxidans*

14

<400> 63
 gtggtctatt cgaaacacgc gcagaaggat gcgaagaagc tggcggtgc tggcttaaaa 60
 aacaacgcaa tagaactcct ggccgttctt gccgccgac catttcagaa cccgccaccc 120
 tacgagaatc tcgtaggcga cctcgccggc gcgtattcac gacgcacaa cattcagcat 180
 cgtttggttt atgaagtctt tccaaaggag cgagtgggtc gcgtgttgcg catgtggaag 240
 cactatgagt ga 252

<210> 64
 <211> 252
 <212> DNA
 <213> *Yersinia enterocolitica*

<400> 64
 atgagaacaa ttagttatag tgaagcgcgc cagaatttgt cgacaacgat ggtgcaaagc 60
 gttgaggatc gagccccat cctcatcacc cgtcaaaatg ggacttcttg tgttcttatg 120
 tcacttgaag aatatgaatc attggaagaa actgcttatt tattgcgttc accagcaaac 180
 gcgaagcact tgatggactc aattgaagag ttgagagcag gaaaaggaaat tcaaaggga 240
 cttgaagcgt ga 252

<210> 65
 <211> 255
 <212> DNA
 <213> *Yersinia enterocolitica*

<400> 65
 gtgaaaatta tattttccag ttgttcttgg gaggattatc tttattggca acaaacggat 60
 aagaaaatcc tcaaacgcac taatgggtta gtaaaaaata ttcaaagaac gccatttgag 120
 gtaaagggca aaccagaacc ccttaaacad aatctggcag ggttctggtc acggaggatg 180
 acagaagagc acagacttgt ttatgaggtt tccggtgata atttattaat tgctgcttat 240
 cgttactatt attga 255

<210> 66
 <211> 210
 <212> DNA
 <213> *Yersinia enterocolitica*

<400> 66
 atgaatagca tcagttatac agccgcaaga aataatttag ccaaggatatt attggaagca 60
 caaaagcagc ccgtagaaat cacgcgccgt gggcagagtg aggtctatat tatcagcaag 120
 gctgattatg aggatttgat gaaagcaaag gtaaaggcac atattcaatt taaacatgca 180
 gaaaccatta aagctcttgc tgatagatga 210

<210> 67
 <211> 357
 <212> DNA
 <213> *Yersinia enterocolitica*

<400> 67
 atgatatttt taacggcaaa tgatattgcg gagttaacg cagaaattat ccctaacggc 60
 aggctgata atagtaagat tgaggctgta gccagccgcg tattaaatgc acatcattat 120
 gacaacgtgg atgatgtata tcagttagcc gctatctact taattgccat tagtcgaggt 180
 cacatttttc ttgatgggaa caagcgcacg gcatttcaaa gcatggcgct gttccttggt 240
 ataatggcg tagacctgtg tgcaagcaat caactggaag aattaaccgt tgaagcagcg 300
 caaggaaaaa ttggtgttga gcagataacg gaacagttac gcgagcttac cgagtaa 357

15

<210> 68
 <211> 83
 <212> PRT
 <213> Actinobacillus actinomycetemcomitans

<400> 68

Met Asn Val Ile Ser Tyr Ser Ala Phe Arg Ala Glu Leu Ala Thr Thr
 1 5 10 15

Leu Asp Gln Val Val Ala Asp His Ser Pro Val Met Ile Thr Arg Gln
 20 25 30

Asn Gly Lys His Ala Val Val Met Ser Leu Glu Asp Phe Ala Ala Tyr
 35 40 45

Glu Glu Thr Ala Tyr Leu Leu Arg Ser Pro Lys Asn Arg Glu Arg Leu
 50 55 60

Leu Ala Ser Ile Asp Gln Leu Asn Ser Gly Lys Ile Ile Glu Arg Glu
 65 70 75 80

Leu Gln Glu

<210> 69
 <211> 84
 <212> PRT
 <213> Actinobacillus actinomycetemcomitans

<400> 69

Met Ile Leu Ala Trp Thr Glu Thr Ala Trp Glu Asp Tyr Leu Tyr Trp
 1 5 10 15

Gln Gln Val Asp Lys Lys Thr Leu Leu Arg Ile Asn Lys Leu Ile Gln
 20 25 30

Asn Ile Thr Arg Ser Pro Phe Glu Gly Leu Gly Asn Pro Lys Pro Leu
 35 40 45

Lys His Gln Leu Ser Gly Phe Trp Ser Arg Arg Ile Asp Lys Glu His
 50 55 60

Arg Leu Val Tyr Gln Val Ser Asp Ser His Leu Thr Ile Ile Gln Cys
 65 70 75 80

Arg Tyr His Tyr

<210> 70
 <211> 84
 <212> PRT
 <213> Agrobacterium tumefaciens

<400> 70

Met Ala Asn Val Arg Phe Thr Glu Phe Arg Gln Asn Phe Ala Thr His
 1 5 10 15

Phe Asp Arg Val Leu Glu Thr Arg Ala Pro Leu Leu Val Thr Arg Gln
 20 25 30

Gly Lys Glu Ala Val Val Val Leu Ala Glu Gly Glu Tyr Glu Ser Met
 35 40 45

16

Gln Glu Thr Leu His Leu Leu Ser Asn Pro Ala Asn Ala Ser Arg Leu
50 55 60

Arg Ala Ser Met Gly Glu Leu Glu Arg Gly Asp Thr Ile Glu Arg Asp
65 70 75 80

Pro Thr Glu Glu

<210> 71
<211> 89
<212> PRT
<213> Agrobacterium tumefaciens

<400> 71

Met Lys Leu Val Trp Thr Leu Ser Ser Trp Asp Asp Tyr Glu Phe Trp
1 5 10 15

Gln Arg Thr Asp Ala Arg Met Val Glu Lys Ile Asn Asp Leu Ile Arg
20 25 30

Asn Ala Lys Arg Thr Pro Phe Ala Gly Leu Gly Lys Pro Glu Pro Leu
35 40 45

Lys Gly Asp Met Ala Gly Tyr Trp Ser Arg Arg Ile Thr Ala Glu His
50 55 60

Arg Phe Val Tyr Arg Val Ser Gly Ser Gly Ser Glu Gln Arg Leu Glu
65 70 75 80

Val Ile Gln Cys Arg Phe His Tyr Gln
85

<210> 72
<211> 82
<212> PRT
<213> Burkholderia cepacia

<400> 72

Met Asn Val Leu Thr Tyr Ser Glu Ala Arg Ala Gly Phe Lys Gln Ala
1 5 10 15

Met Asp Asp Val Cys Arg Asp His Ile Pro Met Leu Ile Thr Arg Gln
20 25 30

Thr Gly Glu Asn Val Val Met Val Ser Leu Ala Asp Phe Asn Ala Met
35 40 45

Gln Glu Thr Leu Tyr Leu Leu Ser Ser Ser Lys Asn Ala Gln Arg Leu
50 55 60

Ala Arg Ser Ile Ala Gln Leu Asn Ala Gly Gly Ala Thr Ala Arg Glu
65 70 75 80

Leu Leu

<210> 73
<211> 83
<212> PRT
<213> Burkholderia cepacia

17

<400> 73

Met Phe Thr Asp Asp Ala Trp Asp Asp Tyr Leu Tyr Trp Gln Glu Thr
 1 5 10 15

Asp Arg Lys Val Val Arg Lys Ile Asn Thr Leu Leu Glu Glu Cys Arg
 20 25 30

Arg Asp Pro Tyr Arg Gly Thr Gly Lys Pro Glu Ala Leu Met Gly Ser
 35 40 45

Met Ser Gly Leu Trp Ser Arg Arg Ile Thr Leu Ala Asp Arg Leu Val
 50 55 60

Tyr Leu Pro Arg Asp Gly Lys Ile Tyr Val Ile Ala Phe Arg Phe His
 65 70 75 80

Tyr Asp Cys

<210> 74

<211> 84

<212> PRT

<213> Coxiella burnetii

<400> 74

Met Asn Val Val Thr Phe Ser Glu Leu Arg Ala Gln Leu Lys Lys Ile
 1 5 10 15

Leu Asp Leu Ser Ala Asp Gln His Glu Pro Val Val Val Lys Arg Pro
 20 25 30

Asn Lys Glu Thr Met Val Ile Leu Ser Leu Arg Asp Phe Glu Ala Leu
 35 40 45

Lys Glu Thr Ala Tyr Leu Leu Ser Asn Glu Ala Asn Ala Ala Arg Leu
 50 55 60

Arg Gln Ser Ile Arg Ser Leu Lys Gln Gly Lys Ala Gln Lys Lys Lys
 65 70 75 80

Leu Met Glu Asp

<210> 75

<211> 91

<212> PRT

<213> Coxiella burnetii

<400> 75

Met Gln Ile Ser Phe Thr Pro Glu Ala Trp Glu Asp Tyr Leu Tyr Trp
 1 5 10 15

Gln Lys Phe Asp Lys Lys Met Leu Arg Arg Ile Asn Glu Leu Ile Lys
 20 25 30

Asp Ala Met His Glu Pro Phe Ser Gly Lys Gly Lys Pro Glu Pro Leu
 35 40 45

Lys Phe Glu Leu Gln Gly Tyr Trp Ser Arg Arg Leu Asp Gln Glu His
 50 55 60

18

Arg Leu Val Tyr Lys Val Leu Asp Asp Ser Leu Met Ile Ile Ala Ala
65 70 75 80

Arg Phe His Tyr Asn Arg Leu Asn Ser Lys Asn
85 90

<210> 76
<211> 92
<212> PRT
<213> Escherichia coli

<400> 76

Met Asn Cys Thr Lys Glu Glu Ile Asp Met Arg Thr Ile Ser Tyr Ser
1 5 10 15

Glu Ala Arg Gln Asn Leu Ser Ala Thr Met Met Lys Ala Val Glu Asp
20 25 30

His Ala Pro Ile Leu Ile Thr Arg Gln Asn Gly Glu Ala Cys Val Leu
35 40 45

Met Ser Leu Glu Glu Tyr Asn Ser Leu Glu Glu Thr Ala Tyr Leu Leu
50 55 60

Arg Ser Pro Ala Asn Ala Arg Arg Leu Met Asp Ser Ile Asp Ser Leu
65 70 75 80

Lys Ser Gly Lys Gly Thr Glu Lys Asp Ile Ile Glu
85 90

<210> 77
<211> 84
<212> PRT
<213> Escherichia coli

<400> 77

Met Lys Leu Ile Trp Ser Glu Glu Ser Trp Asp Asp Tyr Leu Tyr Trp
1 5 10 15

Gln Glu Thr Asp Lys Arg Ile Val Lys Lys Ile Asn Glu Leu Ile Lys
20 25 30

Asp Thr Arg Arg Thr Pro Phe Glu Gly Lys Gly Lys Pro Glu Pro Leu
35 40 45

Lys His Asn Leu Ser Gly Phe Trp Ser Arg Arg Ile Thr Glu Glu His
50 55 60

Arg Leu Val Tyr Ala Val Thr Asp Asp Ser Leu Leu Ile Ala Ala Cys
65 70 75 80

Arg Tyr His Tyr

<210> 78
<211> 89
<212> PRT
<213> Enterococcus faecium

<400> 78

Met Glu Ala Val Ala Tyr Ser Asn Phe Arg Gln Asn Leu Arg Ser Tyr
1 5 10 15

19

Met Lys Gln Val Asn Glu Asp Ala Glu Thr Leu Ile Val Thr Ser Lys
20 25 30

Asp Val Glu Asp Thr Val Val Val Leu Ser Lys Arg Asp Tyr Asp Ser
35 40 45

Met Gln Glu Thr Leu Arg Thr Leu Ser Asn Asn Tyr Val Met Glu Lys
50 55 60

Ile Arg Arg Gly Asp Glu Gln Phe Ser Lys Gly Ala Phe Lys Thr His
65 70 75 80

Asp Leu Ile Glu Val Glu Ser Asp Asp
85

<210> 79

<211> 85

<212> PRT

<213> Enterococcus faecium

<400> 79

Met Ile Lys Ala Trp Ser Asp Asp Ala Trp Asp Asp Tyr Leu Tyr Trp
1 5 10 15

His Glu Gln Gly Asn Lys Ser Asn Ile Lys Lys Ile Asn Lys Leu Ile
20 25 30

Lys Asp Ile Asp Arg Ser Pro Phe Ala Gly Leu Gly Lys Pro Glu Pro
35 40 45

Leu Lys His Asp Leu Ser Gly Lys Trp Ser Arg Arg Ile Thr Asp Glu
50 55 60

His Arg Leu Ile Tyr Arg Val Glu Asn Glu Thr Ile Phe Ile Tyr Ser
65 70 75 80

Ala Lys Asp His Tyr
85

<210> 80

<211> 85

<212> PRT

<213> Francisella tularensis

<400> 80

Met Gln Thr Val Asn Tyr Ser Thr Phe Arg Asn Glu Leu Ser Asp Ser
1 5 10 15

Met Asp Arg Val Thr Lys Asn His Ser Pro Met Ile Val Thr Arg Gly
20 25 30

Ser Lys Lys Glu Ala Val Val Met Met Ser Leu Glu Asp Phe Lys Ala
35 40 45

Tyr Glu Glu Thr Ala Tyr Leu Met Arg Ser Met Asn Asn Tyr Lys Arg
50 55 60

Leu Gln Asn Ser Ile Asp Glu Val Glu Ser Gly Leu Ala Ile Gln Lys
65 70 75 80

Glu Leu Ile Glu Glu

20

85

<210> 81
 <211> 68
 <212> PRT
 <213> *Francisella tularensis*

<400> 81

Met Ile Leu Ser Trp Ser Thr Asn Ala Trp Glu Asp Tyr Leu Tyr Trp
 1 5 10 15

Gln Ser Ile Asp Lys Lys Lys Leu Lys Arg Ile Asn Leu Leu Ile Lys
 20 25 30

Asp Ile Met Arg Asn His Phe Glu Gly Leu Gly Glu Pro Glu Pro Leu
 35 40 45

Lys His Asn Phe Ser Gly Tyr Trp Ser Arg Arg Ile Asp Lys Glu His
 50 55 60

Leu Asn Asn Leu
 65

<210> 82
 <211> 73
 <212> PRT
 <213> *Klebsiella pneumoniae*

<400> 82

Met Arg Thr Val Asn Tyr Ser Glu Ala Arg Gln Asn Leu Ala Asp Val
 1 5 10 15

Leu Glu Ser Ala Val Thr Gly Val Pro Val Thr Ile Thr Arg Arg Gly
 20 25 30

His Lys Ser Ala Val Ile Ile Ser Ala Glu Glu Phe Glu Arg Tyr Gln
 35 40 45

Ala Ala Arg Met Asp Asp Glu Phe Ala Ala Ile Met Ala Val His Gly
 50 55 60

Asp Glu Ile Arg Glu Leu Ala Asp Lys
 65 70

<210> 83
 <211> 122
 <212> PRT
 <213> *Klebsiella pneumoniae*

<400> 83

Met Thr Leu Gln Ile Ile Ser Ala Glu Glu Ile Ile Gln Phe His Asp
 1 5 10 15

Arg Leu Leu Arg Val Thr Pro Gly Val Ala Gly Met Pro Asp Pro Gly
 20 25 30

Arg Ala Glu Ala Ile Met Tyr Arg Val Leu Asn Lys Ile Glu Tyr Glu
 35 40 45

Gly Val Thr Asp Val Trp Arg Leu Ala Ala Met His Leu Leu Ala Ile
 50 55 60

21

Ser Arg Gly His Ile Phe Asn Asp Gly Asn Lys Arg Thr Ala Leu Phe
65 70 75 80

Ile Thr Leu Leu Phe Leu Lys Arg Asn Gly Ile Ile Leu Pro Ala Asn
85 90 95

Pro Asp Phe Val Gly Met Thr Val Glu Ala Ala Ala Gly Gln Leu Thr
100 105 110

Leu Glu Gln Ile Val Ala Arg Leu Arg Gly
115 120

<210> 84
<211> 91
<212> PRT
<213> Mycobacterium bovis

<400> 84

Met Ser Ile Ser Ala Ser Glu Ala Arg Gln Arg Leu Phe Pro Leu Ile
1 5 10 15

Glu Gln Val Asn Thr Asp His Gln Pro Val Arg Ile Thr Ser Arg Ala
20 25 30

Gly Asp Ala Val Leu Met Ser Ala Asp Asp Tyr Asp Ala Trp Gln Glu
35 40 45

Thr Val Tyr Leu Leu Arg Ser Pro Glu Asn Ala Arg Arg Leu Met Glu
50 55 60

Ala Val Ala Arg Asp Lys Ala Gly His Ser Ala Phe Thr Lys Ser Val
65 70 75 80

Asp Glu Leu Arg Glu Met Ala Gly Gly Glu Glu
85 90

<210> 85
<211> 85
<212> PRT
<213> Mycobacterium bovis

<400> 85

Met Arg Ser Val Asn Phe Asp Pro Asp Ala Trp Glu Asp Phe Leu Phe
1 5 10 15

Trp Leu Ala Ala Asp Arg Lys Thr Ala Arg Arg Ile Thr Arg Leu Ile
20 25 30

Gly Glu Ile Gln Arg Asp Pro Phe Ser Gly Ile Gly Lys Pro Glu Pro
35 40 45

Leu Gln Gly Glu Leu Ser Gly Tyr Trp Ser Arg Arg Ile Asp Asp Glu
50 55 60

His Arg Leu Val Tyr Arg Ala Gly Asp Asp Glu Val Thr Met Leu Lys
65 70 75 80

Ala Arg Tyr His Tyr
85

<210> 86
<211> 91

22

<212> PRT

<213> Mycobacterium tuberculosis

<400> 86

Met Ser Ile Ser Ala Ser Glu Ala Arg Gln Arg Leu Phe Pro Leu Ile
 1 5 10 15

Glu Gln Val Asn Thr Asp His Gln Pro Val Arg Ile Thr Ser Arg Ala
 20 25 30

Gly Asp Ala Val Leu Met Ser Ala Asp Asp Tyr Asp Ala Trp Gln Glu
 35 40 45

Thr Val Tyr Leu Leu Arg Ser Pro Glu Asn Ala Arg Arg Leu Met Glu
 50 55 60

Ala Val Ala Arg Asp Lys Ala Gly His Ser Ala Phe Thr Lys Ser Val
 65 70 75 80

Asp Glu Leu Arg Glu Met Ala Gly Gly Glu Glu
 85 90

<210> 87

<211> 85

<212> PRT

<213> Mycobacterium tuberculosis

<400> 87

Met Arg Ser Val Asn Phe Asp Pro Asp Ala Trp Glu Asp Phe Leu Phe
 1 5 10 15

Trp Leu Ala Ala Asp Arg Lys Thr Ala Arg Arg Ile Thr Arg Leu Ile
 20 25 30

Gly Glu Ile Gln Arg Asp Pro Phe Ser Gly Ile Gly Lys Pro Glu Pro
 35 40 45

Leu Gln Gly Glu Leu Ser Gly Tyr Trp Ser Arg Arg Ile Asp Asp Glu
 50 55 60

His Arg Leu Val Tyr Arg Ala Gly Asp Asp Glu Val Thr Met Leu Lys
 65 70 75 80

Ala Arg Tyr His Tyr
 85

<210> 88

<211> 98

<212> PRT

<213> Neisseria europea A

<400> 88

Met Ala Glu Cys Asn Val Gln Ile Asn Val Gln Leu Glu Asn Leu Met
 1 5 10 15

Asp Ala Ile Thr Tyr Ser Thr Ala Arg Ala Lys Leu Ala Asp Thr Met
 20 25 30

Asn Arg Val Cys Asp Asn His Glu Pro Ile Ile Ile Thr Arg Asn Gly
 35 40 45

Glu Gln Ser Val Val Met Met Ser Leu Asp Asp Phe Lys Ala Leu Glu

23

50

55

60

Glu Thr Ser Tyr Leu Leu Arg Ser Pro Lys Asn Ala Lys Arg Leu Leu
 65 70 75 80

Glu Ser Ile Ala Ala Leu Glu Ser Gly Arg Gly Glu Thr Arg Ser Leu
 85 90 95

Ala Glu

<210> 89
 <211> 84
 <212> PRT
 <213> Neisseria europea A

<400> 89

Met Lys Leu Val Phe Ser Glu Gln Ala Trp Glu Asp Tyr Leu Tyr Trp
 1 5 10 15

Gln Lys Thr Asp Arg Lys Thr Val Gln Arg Ile Asp Thr Leu Val Lys
 20 25 30

Glu Ile Thr Arg Thr Pro His Glu Gly Thr Gly Lys Pro Glu Pro Leu
 35 40 45

Lys His Ala Leu Ser Gly Tyr Trp Ser Arg Arg Ile Asn Asn Glu His
 50 55 60

Arg Ile Val Tyr Lys Ile Ala Asp Asp Ser Leu Phe Ile Ala Gln Leu
 65 70 75 80

Arg Tyr His Tyr

<210> 90
 <211> 102
 <212> PRT
 <213> Neisseria europea B

<400> 90

Met Tyr Leu Phe Tyr Thr Cys Thr Ile Tyr Cys Ala Asn Glu Val Ala
 1 5 10 15

Met Lys Val Val Thr Tyr Ser His Ala Arg Asn Ala Leu Lys Ser Ile
 20 25 30

Leu Asp Asp Val Ile Gln Asp Ala Asp Val Ile Val Ile Ser Arg Arg
 35 40 45

Asp Ala Glu Gly Asp Ala Val Val Met Ser Leu Asp Ser Tyr Asn Ser
 50 55 60

Ile Met Glu Thr Leu His Leu Thr Ser Asn Pro Ala Asn Ala Ala Ala
 65 70 75 80

Leu Ala Lys Ala Ile Ala Gln Asp Lys Ala Gly Gln Ala Gln Asp His
 85 90 95

Pro Leu Leu Ser Ala Asp
 100

24

<210> 91
 <211> 86
 <212> PRT
 <213> Neisseria europea B

<400> 91

Met Arg Ala Ile Arg Phe Val Pro Asp Ala Trp Glu Ala Tyr Leu Tyr
 1 5 10 15

Trp Gln Asp Gln Asp Lys Lys Thr Leu Arg Arg Leu Asn Ser Leu Ile
 20 25 30

Thr Ala Ala Ser Arg Asp Pro Phe Val Gly Ile Gly Lys Pro Glu Pro
 35 40 45

Leu Arg Gly Glu Leu Ser Gly Tyr Trp Ser Arg Arg Ile Asp Glu Thr
 50 55 60

Asn Arg Leu Val Tyr Arg Val Thr Asp Val Glu Leu Val Ile Ile Ala
 65 70 75 80

Cys Arg Phe His Tyr Glu
 85

<210> 92
 <211> 80
 <212> PRT
 <213> Neisseria europea C

<400> 92

Met Ala Ile Leu Asn Ala Thr Glu Ala Arg Ala Arg Leu Tyr Ala Leu
 1 5 10 15

Ile Asp Glu Ala Ala Glu Thr His Gln Pro Ile Val Ile Lys Gly Lys
 20 25 30

Arg Ser Ser Ala Val Leu Leu Ser Glu Glu Asp Trp Asn Ala Ile Asn
 35 40 45

Glu Thr Leu Tyr Leu Val Ser Ile Pro Gly Met Arg Glu Ser Ile Met
 50 55 60

Glu Gly Met Lys Thr Asp Val Asp Glu Cys Ser Arg Glu Leu Asp Trp
 65 70 75 80

<210> 93
 <211> 86
 <212> PRT
 <213> Neisseria europea C

<400> 93

Met Trp Glu Leu Arg Tyr Thr His Gln Ala Gln Lys Asp Ala Lys Lys
 1 5 10 15

Leu Ala Ser Ser Gly Leu Lys Asp Lys Ala Glu Glu Leu Leu Ala Val
 20 25 30

Val Arg Asn Asn Pro Tyr Gln Thr Pro Pro Pro Tyr Glu Lys Leu Val
 35 40 45

Gly Asp Leu Ala Gly Ala Cys Ser Arg Arg Ile Asn Ile Gln His Arg
 50 55 60

Leu Val Tyr Gln Val Leu Glu Arg Glu Arg Ile Val Lys Val Leu Arg
65 70 75 80

Met Trp Thr His Tyr Val
85

<210> 94
<211> 135
<212> PRT
<213> Nostoc sp. PCC 7120

<400> 94

Met Tyr Trp Ile Lys Phe Glu Ser Thr Gln Arg Glu Leu Leu Ile Leu
1 5 10 15

Met Leu Ser Asn Thr Tyr Thr Tyr Thr Gln Ala Arg Asp Arg Leu Ser
20 25 30

Glu Leu Cys Asp Lys Val Thr Ser Glu Arg Asp Phe Val Val Ile Thr
35 40 45

Arg Arg Asn Ala Glu Asn Val Ala Leu Ile Pro Val Asp Glu Leu Ser
50 55 60

Ser Leu Leu Glu Thr Ala His Leu Leu Arg Ser Pro Arg Asn Ala Glu
65 70 75 80

Arg Leu Leu Arg Ala Leu Asp Arg Ala Lys Ser Gly Val Val Glu Ser
85 90 95

Gln Ser Leu Asp Asp Ile Arg Lys Glu Leu Gly Phe Asp Gln Lys Glu
100 105 110

Glu Ser Gln Lys Pro Ile Lys Arg Arg Ser Ser Ser Asn Ser Lys Ala
115 120 125

Lys Lys Asn Ser Val Ser Thr
130 135

<210> 95
<211> 81
<212> PRT
<213> Nostoc sp. PCC 7120

<400> 95

Met Phe Gln Pro Glu Phe Leu Glu Asp Leu Glu Phe Trp Val Glu Thr
1 5 10 15

Asn Gln Arg Val Ala Leu Lys Ala Leu Asp Leu Val Lys Glu Thr Cys
20 25 30

Arg Asp Pro Phe Lys Gly Lys Gly Lys Pro Glu Pro Leu Lys Tyr Leu
35 40 45

Asp Pro Asp Thr Trp Ser Arg Arg Leu Thr Gln Glu His Arg Ile Val
50 55 60

Tyr Leu Val Lys Asp Asp Glu Ile Asn Phe Leu Gln Ala Arg Tyr His
65 70 75 80

26

Tyr

<210> 96
 <211> 84
 <212> PRT
 <213> Pseudomonas fluorescense

<400> 96

Met Asp Thr Ile Asn Tyr Thr Thr Ala Arg Ala His Leu Ala Glu Thr
 1 5 10 15

Met Asp Arg Val Asn Glu Asp Cys Ala Pro Leu Leu Val Thr Arg Gln
 20 25 30

Lys Gly Glu Pro Val Val Met Met Ser Leu Ala Glu Tyr Asn Ala Leu
 35 40 45

Glu Glu Thr Ala Tyr Leu Leu Arg Ser Pro Ala Asn Ala Glu Arg Leu
 50 55 60

Ile Lys Ser Ile Gly Glu Met Arg Ala Gly Lys Ala Lys Val Arg Gln
 65 70 75 80

Leu Ile Glu Glu

<210> 97
 <211> 84
 <212> PRT
 <213> Pseudomonas fluorescense

<400> 97

Met Lys Ile Gln Phe Thr Pro Thr Gly Trp Glu Asp Tyr Leu Trp Phe
 1 5 10 15

Gln Gln Asn Asp Lys Ala Gly Leu Lys Arg Ile Asn Leu Leu Ile Lys
 20 25 30

Ala Ile Gln Arg Gln Pro Phe Glu Gly Leu Gly Lys Pro Glu Pro Leu
 35 40 45

Lys His Asn Met Ser Gly Phe Trp Ser Arg Arg Ile Thr Ala Glu His
 50 55 60

Arg Leu Val Tyr Ala Ile Val Asp Gly Glu Ile Cys Val Ile Thr Cys
 65 70 75 80

Arg Phe His Tyr

<210> 98
 <211> 94
 <212> PRT
 <213> Pseudomonas putida

<400> 98

Met His Val Leu Thr Phe Ser Gln Ala Arg Ala Glu Leu Lys Gln Thr
 1 5 10 15

Met Asp Asp Val Cys Arg Asp His Glu Pro Ala Val Ile Thr Arg Gln
 20 25 30

27

Arg Gly Glu Pro Val Val Met Met Ser Leu Glu Asp Tyr Asn Gly Met
35 40 45

Asn Glu Thr Ile His Leu Leu Gly Ser Ser Lys Asn Ala Ser Arg Leu
50 55 60

Arg Ser Ser Ile Ala Gln Leu Arg Asp Gly Gln Ala Leu Thr Lys Glu
65 70 75 80

Leu Asp Leu Asn Glu Gln Glu Pro Glu Ala Ala Glu Gln Glu
85 90

<210> 99
<211> 84
<212> PRT
<213> *Pseudomonas putida*

<400> 99

Met Lys Phe Thr Lys Glu Gly Trp Glu Asp Tyr Cys His Trp Gln Asn
1 5 10 15

Ala Asp Leu Thr Ile Leu Gly Asn Ile Asn Arg Leu Ile Asp Val Cys
20 25 30

Leu Arg Thr Pro Phe Thr Gly Ile Gly Lys Pro Glu Pro Leu Lys Gly
35 40 45

Asp Leu Ser Gly Leu Trp Ser Arg Arg Ile Thr Arg Glu His Arg Leu
50 55 60

Val Tyr Phe Phe Glu Ala Gly Met Leu Thr Val Leu Gln Cys Arg Tyr
65 70 75 80

His Tyr Asp Asp

<210> 100
<211> 92
<212> PRT
<213> *Pseudomonas syringae*

<400> 100

Met Gln Val Leu Ser Phe Ser Gln Ala Arg Ala Gly Leu Lys Gln Ala
1 5 10 15

Met Asp Asp Val Cys Arg Asp His Glu Pro Ala Leu Ile Thr Arg Leu
20 25 30

Arg Gly Asp His Val Val Met Leu Ser Leu Asp Asp Tyr Asn Ser Met
35 40 45

Ser Glu Thr Met Tyr Leu Leu Gly Thr Glu Ala Asn Ala Lys His Leu
50 55 60

Arg Gln Ser Ile Ala Gln His Lys Ala Gly Lys Ala Phe Val Lys Glu
65 70 75 80

Ile Ser Leu Asp Val Thr Gly Ser Glu Thr Glu Glu
85 90

<210> 101

28

<211> 82
 <212> PRT
 <213> *Pseudomonas syringae*

<400> 101

Met His Phe Thr Leu Ser Gly Trp Asp Asp Tyr Thr His Trp Lys Asp
 1 5 10 15

Ala Asp Gln Ala Ile Ser Leu Ser Ile Asp Ser Leu Ile Ser Gln Cys
 20 25 30

Leu Arg Thr Pro Phe Lys Gly Thr Gly Lys Pro Arg Pro Leu Thr Gly
 35 40 45

Asp Leu Thr Gly Tyr Trp Ser Arg Arg Ile Thr Lys Glu His Arg Leu
 50 55 60

Val Tyr Phe Tyr Glu Gly Gly Val Leu Thr Val Ile Ala Cys Arg His
 65 70 75 80

His Tyr

<210> 102
 <211> 64
 <212> PRT
 <213> *Rickettsia conorii*

<400> 102

Met Asn Ser Ile Ser Gly Thr Ser Phe Arg Lys Asn Leu Ser Ser Val
 1 5 10 15

Leu Asn Thr Val Glu Asn Asp His Val Pro Tyr Leu Ile Lys Arg Lys
 20 25 30

Asn His Lys Asn Ile Ile Leu Leu Thr Glu Glu Glu Tyr Glu Ser Thr
 35 40 45

Lys Glu Thr Leu Tyr Leu Leu Ser Asn Leu Gly Leu Met Arg Ile Glu
 50 55 60

<210> 103
 <211> 78
 <212> PRT
 <213> *Rickettsia conorii*

<400> 103

Thr Leu Glu Ser Ala Glu Asp Leu Ala Tyr Trp Lys Lys Tyr Asp Ile
 1 5 10 15

Lys Lys Tyr Glu Arg Ile Lys Leu Leu Ile Lys Asn Ile Gln Glu Ala
 20 25 30

Pro Val Thr Gly Ile Gly Lys Pro Glu Pro Leu Lys His Ile Leu Ser
 35 40 45

Gly Leu Trp Ser Arg Arg Ile Asn His Glu His Arg Leu Ile Tyr Ser
 50 55 60

Val Asn Thr Lys Gln Ile Ile Tyr Asn Cys Ser Phe His
 65 70 75

29

<210> 104
 <211> 75
 <212> PRT
 <213> Salmonella typhi

<400> 104

Met Phe Met Arg Thr Val Asn Tyr Ser Glu Ala Arg Gln Asn Leu Ala
 1 5 10 15

Glu Val Leu Glu Ser Ala Val Thr Gly Gly Pro Val Thr Ile Thr Arg
 20 25 30

Arg Gly His Lys Ser Ala Val Ile Ile Ser Ala Glu Glu Phe Glu Arg
 35 40 45

Tyr Gln Thr Ala Arg Met Asp Asp Glu Phe Ala Ala Ile Met Ala Val
 50 55 60

His Gly Asn Glu Leu Arg Glu Leu Ala Asp Lys
 65 70 75

<210> 105
 <211> 122
 <212> PRT
 <213> Salmonella typhi

<400> 105

Met Thr Leu Gln Leu Ile Ser Ala Glu Glu Ile Ile Gln Phe His Asp
 1 5 10 15

Arg Leu Leu Arg Val Thr Pro Gly Val Thr Gly Met Pro Asp Pro Gly
 20 25 30

Arg Ala Glu Ala Leu Met Tyr Arg Val Leu Lys Gln Ile Glu Tyr Glu
 35 40 45

Gly Val Thr Asp Val Trp Leu Leu Ala Ala Met His Leu Leu Ala Ile
 50 55 60

Ser Arg Gly His Ile Phe Asn Asp Gly Asn Lys Arg Thr Ala Leu Phe
 65 70 75 80

Ile Thr Leu Leu Phe Leu Lys Arg Asn Gly Ile Ser Leu Ala Ala Asn
 85 90 95

Pro Asp Phe Val Asp Met Thr Val Asp Ala Ala Ala Gly Arg Leu Thr
 100 105 110

Leu Glu Gln Ile Ala Val Arg Leu Arg Ala
 115 120

<210> 106
 <211> 83
 <212> PRT
 <213> Streptococcus aureus

<400> 106

Met Ile Ile Lys Asn Tyr Ser Tyr Ala Arg Gln Asn Leu Lys Ala Leu
 1 5 10 15

Met Thr Lys Val Asn Asp Asp Ser Asp Met Val Thr Val Thr Ser Thr
 20 25 30

30

Asp Asp Lys Asn Val Val Ile Met Ser Glu Ser Asp Tyr Asn Ser Met
 35 40 45

Met Glu Thr Leu Tyr Leu Gln Gln Asn Pro Asn Asn Ala Glu His Leu
 50 55 60

Ala Gln Ser Ile Ala Asp Leu Glu Arg Gly Lys Thr Ile Thr Lys Asp
 65 70 75 80

Ile Asp Val

<210> 107
 <211> 88
 <212> PRT
 <213> Streptococcus aureus

<400> 107

Met Ala Arg Leu Asn Ile Thr Phe Ser Pro Gln Ala Phe Glu Asp Tyr
 1 5 10 15

Lys Tyr Phe Gln Gln Asn Asn Lys Lys Met Val Lys Lys Ile Asn Glu
 20 25 30

Leu Leu Lys Ser Ile Asp Arg Asn Gly Ala Leu Glu Gly Ile Gly Lys
 35 40 45

Pro Glu Lys Leu Lys Ser Asn Leu Thr Gly Tyr Tyr Ser Arg Arg Ile
 50 55 60

Asn His Glu His Arg Leu Val Tyr Thr Val Asp Asp Asn His Ile Lys
 65 70 75 80

Ile Ala Ser Cys Lys Tyr His Tyr
 85

<210> 108
 <211> 84
 <212> PRT
 <213> Streptococcus pneumoniae

<400> 108

Met Glu Ala Val Leu Tyr Ser Thr Phe Arg Asn His Leu Lys Asp Tyr
 1 5 10 15

Met Lys Lys Val Asn Asp Glu Phe Glu Pro Leu Thr Val Val Asn Lys
 20 25 30

Asn Pro Asp Glu Asp Ile Val Val Leu Ser Lys Ser Glu Trp Asp Ser
 35 40 45

Ile Gln Glu Thr Leu Arg Ile Ala Gln Asn Lys Glu Leu Ser Asp Lys
 50 55 60

Val Leu Arg Gly Met Ala Gln Val Arg Ala Gly Ser Thr Gln Val His
 65 70 75 80

Val Ile Glu Glu

<210> 109

31

<211> 84
 <212> PRT
 <213> Streptococcus pneumoniae

<400> 109

Met Leu Leu Lys Phe Thr Glu Asp Ala Trp Ala Asp Tyr Cys Tyr Trp
 1 5 10 15

Gln Asn Gln Asp Lys Lys Thr Leu Lys Arg Ile Asn Lys Leu Ile Lys
 20 25 30

Asp Ile Gln Arg Asp Pro Phe Thr Gly Ile Gly Lys Pro Glu Pro Leu
 35 40 45

Lys Tyr Asp Tyr Gln Gly Ala Trp Ser Arg Arg Ile Asp Ala Glu Asn
 50 55 60

Arg Leu Ile Tyr Met Met Asp Gly Asp Ser Val Ala Phe Leu Ser Phe
 65 70 75 80

Lys Asp His Tyr

<210> 110
 <211> 87
 <212> PRT
 <213> Streptomyces coelicolor

<400> 110

Met Ser Ile Thr Ala Ser Glu Ala Arg Gln Asn Leu Phe Pro Leu Ile
 1 5 10 15

Glu Gln Val Asn Glu Asp His Ala Pro Val His Ile Thr Ser Arg Lys
 20 25 30

Gly Asn Ala Val Leu Met Ser Glu Glu Asp Phe Thr Ala Trp Thr Glu
 35 40 45

Thr Val His Leu Leu Arg Ser Pro Arg Asn Ala Arg Arg Leu Leu Asp
 50 55 60

Ser Ile Ala Glu Ala Glu Ala Gly Asp Ala Thr Glu His Asp Leu Ile
 65 70 75 80

Asp Pro Asp Ala Glu Arg Ala
 85

<210> 111
 <211> 84
 <212> PRT
 <213> Streptomyces coelicolor

<400> 111

Met Arg Ile Thr Phe Thr Ser His Gly Trp Glu Asp Tyr Val His Trp
 1 5 10 15

Ala Glu Ser Asp Arg Lys Val Thr Lys Arg Ile Asn Arg Leu Ile Ala
 20 25 30

Asp Ile Ala Arg Asp Pro Phe Lys Gly Val Gly Lys Pro Glu Pro Leu
 35 40 45

32

Lys Gly Asp Leu Ser Gly Tyr Trp Ser Arg Arg Ile Asp Asp Thr His
 50 55 60

Arg Leu Val Tyr Lys Pro Thr Asp Asp Gln Leu Val Ile Val Gln Ala
 65 70 75 80

Arg Tyr His Tyr

<210> 112
 <211> 93
 <212> PRT
 <213> Streptomyces viridochromogenes

<400> 112

Met Ser Ile Asn Arg Glu Arg Ser Arg Lys Ala Leu Phe Pro Leu Ile
 1 5 10 15

Lys Lys Val Asn Asp Asn His Glu Ala Ile Glu Ile Val Ser Lys His
 20 25 30

Gly Asn Ala Val Leu Val Ser Ala Glu Asp Tyr Ala Ala Leu Arg Glu
 35 40 45

Gly Ser Tyr Leu Leu Arg Ser Pro Ala Asn Ala Arg Arg Leu Leu Lys
 50 55 60

Ala Tyr Glu Asn Ala Leu Ala His Val Asn Val Ser Glu Arg Glu Leu
 65 70 75 80

Ile Asp Pro Asp Ser Ala Asp Ala Gly Ser Gly Ala Ala
 85 90

<210> 113
 <211> 84
 <212> PRT
 <213> Streptomyces viridochromogenes

<400> 113

Met Arg Leu Val Phe Glu Asp Gln Gly Trp Asp Asp Tyr Thr Ser Trp
 1 5 10 15

Leu Lys Asn Asp Arg Lys Met Leu Ala Arg Ile Asn Lys Leu Ile Glu
 20 25 30

Asp Val Arg Arg Asp Pro Phe Thr Gly Ile Gly Lys Pro Glu Pro Leu
 35 40 45

Lys Tyr His Leu Pro Gly Ala Trp Ser Arg Arg Ile Asp Asp Glu His
 50 55 60

Arg Leu Val Tyr Leu Val Thr Asp Lys Glu Ile Val Ile Leu Ala Ala
 65 70 75 80

Arg Tyr His Tyr

<210> 114
 <211> 100
 <212> PRT
 <213> Synechocystis sp. PCC 7942

<400> 114

33

Met Ala Lys Cys Tyr Cys Cys Thr Thr Ser Cys Thr Thr Pro Arg Leu
1 5 10 15

Met Lys Val Val Ser Phe Ser Asp Ala Arg Lys Asn Leu Lys Thr Val
20 25 30

Leu Asp Glu Val Val Asn Asp Ala Asp Tyr Thr Ile Ile Thr Arg Arg
35 40 45

Asn Ala Glu Glu Val Val Val Met Ser Leu Asp Ser Phe Asn Ser Leu
50 55 60

Ile Glu Thr Phe His Leu Leu Lys Ser Pro Ala Asn Ala Ala His Leu
65 70 75 80

Gln Arg Ser Ile Ala Gln Tyr Gln Gln Gly Gln Thr Val Glu Arg Asn
85 90 95

Leu Leu Asp Ala
100

<210> 115
<211> 87
<212> PRT
<213> Synechocystis sp. PCC 7942
<400> 115

Met Arg Lys Leu Ala Trp Thr Asn Glu Ala Trp Glu Asp Tyr Leu Tyr
1 5 10 15

Trp Gln Gly Gln Asp Lys Lys Thr Leu Asn Arg Ile Asn Lys Leu Ile
20 25 30

Thr Glu Thr Leu Arg Ser Pro Phe Glu Gly Ile Gly Lys Pro Glu Ala
35 40 45

Leu Arg Glu Asn Leu Thr Gly Phe Trp Ser Arg Arg Ile Asp Asp Thr
50 55 60

Asn Arg Leu Val Tyr Ala Val Ala Asp Asp Tyr Leu Thr Ile Ile Ser
65 70 75 80

Cys Arg Tyr His Tyr Ser Asp
85

<210> 116
<211> 87
<212> PRT
<213> Synechocystis sp. PCC 6803 A
<400> 116

Met Lys Ala Ile Thr Thr Gln Ala Lys Asp His Leu Asp Glu Leu
1 5 10 15

Ile Asn Ala Val Ile Ser Asp Leu Glu Pro Thr Ile Val Ser Asn Asn
20 25 30

Gln Gly Gln Gln Ala Val Leu Ile Ser Leu Asp Glu Phe Asn Ser Trp
35 40 45

Gln Glu Thr Leu Tyr Leu Leu Ser Asn Pro Thr Asn Ala Glu His Leu

34

50

55

60

Met Ala Ser Ile Lys Gln Ala Glu Thr Gly Gln Ile Ile Lys Gln Lys
65 70 75 80

Leu Pro Asp Leu Leu Glu Leu
85

<210> 117
<211> 86
<212> PRT
<213> Synechocystis sp. PCC 6803 A

<400> 117

Met Lys Ile Ala Phe Thr Glu Leu Ser Trp His Asp Tyr Leu Trp Phe
1 5 10 15

Gln Gln Asn Asp Lys Lys Leu Leu Lys Arg Ile Asn Leu Leu Ile Lys
20 25 30

Ala Ile Ala Arg Asp Pro Phe Asp Gly Ile Gly Lys Pro Glu Pro Leu
35 40 45

Lys Ala Asn Leu Ser Gly Tyr Trp Ser Arg Arg Ile Asn Ser Glu His
50 55 60

Arg Leu Val Tyr Thr Ile Ala Asp Arg Asp Leu Leu Ile Ile Ser Cys
65 70 75 80

Arg Phe His Tyr Gln Arg
85

<210> 118
<211> 87
<212> PRT
<213> Synechocystis sp. PCC 6803 B

<400> 118

Met Glu Thr Ile Asn Tyr Gln Gln Phe Ser Glu Lys Leu Pro Thr Leu
1 5 10 15

Val Glu Lys Ile Gly Asn Glu Gln Glu Pro Leu Cys Leu Glu Leu Pro
20 25 30

Asn Tyr Leu Arg Ala Val Ile Ile Ser Glu Gln Asp Tyr Arg Ser Leu
35 40 45

Met Glu Thr Val Tyr Leu Leu Ser Asn Pro Val Asn Ala Glu Lys Leu
50 55 60

Leu Thr Thr Ala Ser Arg Ser Ile Asp Gln Ala Thr Ser Trp Thr Lys
65 70 75 80

Val Lys Asn Asp Leu Gly Leu
85

<210> 119
<211> 86
<212> PRT
<213> Synechocystis sp. PCC 6803 B

<400> 119

35

Met Lys Glu Val Val Leu Asp Ser Gln Ala Ile Glu Asp Ile Lys Trp
 1 5 10 15

Trp Ile Gln Gln Asp Lys Lys Leu Ala Leu Lys Ile Met Glu Leu Ile
 20 25 30

Glu Thr Leu Pro Lys Ser Pro Phe Ala Gly Lys Gly Lys Pro Glu Lys
 35 40 45

Leu Arg Phe Asn Leu Ser Gly Phe Trp Pro Arg Arg Ile Thr Gln Glu
 50 55 60

His Arg Leu Val Tyr Glu Val Thr Asp Asp Phe Ile Arg Val Val Ser
 65 70 75 80

Cys Arg Tyr His Tyr Arg
 85

<210> 120
 <211> 80
 <212> PRT
 <213> *Tiobacillus ferrooxidans*

<400> 120

Met Ser Thr Leu Thr Ala Ser Glu Ala Arg Ala Asn Leu Tyr Arg Leu
 1 5 10 15

Ile Asp Gln Ala Ala Glu Ser His Gln Pro Ile Tyr Ile Ala Gly Lys
 20 25 30

Arg Thr Ser Ala Val Leu Leu Ser Thr Glu Asp Trp Glu Ala Ile Gln
 35 40 45

Glu Thr Leu Tyr Leu Leu Ser Val Pro Gly Met Arg Glu Ser Ile Lys
 50 55 60

Glu Gly Met Ala Glu Pro Leu Ser Lys Ser Asn Met Asp Leu Lys Trp
 65 70 75 80

<210> 121
 <211> 83
 <212> PRT
 <213> *Tiobacillus ferrooxidans*

<400> 121

Met Val Tyr Ser Lys His Ala Gln Lys Asp Ala Lys Lys Leu Ala Ala
 1 5 10 15

Ala Gly Leu Lys Asn Asn Ala Ile Glu Leu Leu Ala Val Leu Ala Ala
 20 25 30

Asp Pro Phe Gln Asn Pro Pro Pro Tyr Glu Asn Leu Val Gly Asp Leu
 35 40 45

Ala Gly Ala Tyr Ser Arg Arg Ile Asn Ile Gln His Arg Leu Val Tyr
 50 55 60

Glu Val Phe Pro Lys Glu Arg Val Val Arg Val Leu Arg Met Trp Thr
 65 70 75 80

His Tyr Glu

<210> 122
 <211> 83
 <212> PRT
 <213> *Yersinia enterocolitica*

<400> 122

Met Arg Thr Ile Ser Tyr Ser Glu Ala Arg Gln Asn Leu Ser Thr Thr
 1 5 10 15

Met Val Gln Thr Val Glu Asp Arg Ala Pro Ile Leu Ile Thr Arg Gln
 20 25 30

Asn Gly Thr Ser Cys Val Leu Met Ser Leu Glu Glu Tyr Glu Ser Leu
 35 40 45

Glu Glu Thr Ala Tyr Leu Leu Arg Ser Pro Ala Asn Ala Lys His Leu
 50 55 60

Met Asp Ser Ile Glu Glu Leu Arg Ala Gly Lys Gly Ile Gln Arg Glu
 65 70 75 80

Leu Glu Ala

<210> 123
 <211> 84
 <212> PRT
 <213> *Yersinia enterocolitica*

<400> 123

Met Lys Ile Ile Phe Ser Ser Cys Ser Trp Glu Asp Tyr Leu Tyr Trp
 1 5 10 15

Gln Gln Thr Asp Lys Lys Ile Leu Lys Arg Ile Asn Gly Leu Val Lys
 20 25 30

Asn Ile Gln Arg Thr Pro Phe Glu Val Lys Gly Lys Pro Glu Pro Leu
 35 40 45

Lys His Asn Leu Ala Gly Phe Trp Ser Arg Arg Met Thr Glu Glu His
 50 55 60

Arg Leu Val Tyr Glu Val Ser Gly Asp Asn Leu Leu Ile Ala Ala Tyr
 65 70 75 80

Arg Tyr Tyr Tyr

<210> 124
 <211> 69
 <212> PRT
 <213> *Yersinia enterocolitica*

<400> 124

Met Asn Ser Ile Ser Tyr Thr Ala Ala Arg Asn Asn Leu Ala Lys Val
 1 5 10 15

Leu Leu Glu Ala Gln Lys Gln Pro Val Glu Ile Thr Arg Arg Gly Gln
 20 25 30

Ser Glu Val Tyr Ile Ile Ser Lys Ala Asp Tyr Glu Asp Leu Met Lys

37

35

40

45

Ala Lys Val Lys Ala His Ile Gln Phe Lys His Ala Glu Thr Ile Lys
 50 55 60

Ala Leu Ala Asp Arg
 65

<210> 125
 <211> 118
 <212> PRT
 <213> *Yersinia enterocolitica*

<400> 125

Met Ile Phe Leu Thr Ala Asn Asp Ile Ala Glu Phe Asn Ala Glu Ile
 1 5 10 15

Ile Pro Asn Gly Arg Pro Asp Asn Ser Lys Ile Glu Ala Val Ala Ser
 20 25 30

Arg Val Leu Asn Ala His His Tyr Asp Asn Val Asp Asp Val Tyr Gln
 35 40 45

Leu Ala Ala Ile Tyr Leu Ile Ala Ile Ser Arg Gly His Ile Phe Leu
 50 55 60

Asp Gly Asn Lys Arg Thr Ala Phe Gln Ser Met Ala Leu Phe Leu Gly
 65 70 75 80

Ile Asn Gly Val Asp Leu Cys Ala Ser Asn Gln Leu Glu Glu Leu Thr
 85 90 95

Val Glu Ala Ala Gln Gly Lys Ile Gly Val Glu Gln Ile Thr Glu Gln
 100 105 110

Leu Arg Glu Leu Thr Glu
 115

<210> 126
 <211> 20
 <212> DNA
 <213> Artificial sequence

<220>
 <223> Antisense sequence for YefM antitoxin

<400> 126
 ggatcggggc atgatcttca

20

<210> 127
 <211> 21
 <212> DNA
 <213> Artificial sequence

<220>
 <223> siRNA oligonucleotide

<400> 127
 gccguugaag aucaugccct t

21

<210> 128
 <211> 21
 <212> DNA
 <213> Artificial sequence

<220>

38

<223> siRNA oligonucleotide

<400> 128

gggcaugauc uucaacggct t

21

<210> 129

<211> 17

<212> PRT

<213> Artificial sequence

<220>

<223> Synthetic peptide

<400> 129

Arg Thr Ile Ser Tyr Ser Glu Ala Arg Gln Asn Leu Ser Ala Thr Met
1 5 10 15

Met

<210> 130

<211> 13

<212> PRT

<213> Artificial sequence

<220>

<223> Synthetic peptide

<400> 130

Ala Pro Ile Leu Ile Thr Arg Gln Asn Gly Glu Ala Cys
1 5 10

<210> 131

<211> 16

<212> PRT

<213> Artificial sequence

<220>

<223> Synthetic peptide

<400> 131

Met Asp Ser Ile Asp Ser Leu Lys Ser Gly Lys Gly Thr Glu Lys Asp
1 5 10 15

<210> 132

<211> 20

<212> DNA

<213> Artificial sequence

<220>

<223> Single strand DNA oligonucleotide

<400> 4

ataatgataa cgacacgctg